STIC Search Report
EIC 2600

STIC Database Tracking Number: 141675

TO: Scott Beliveau
Location: Pk2 6C41
Art Unit: 2614
Wednesday, January 05, 2005

Case Serial Number: 09525412

From: Pamela Reynolds
Location: EIC 2600
PK2-3C03
Phone: 306-0255

Pamela.Reynolds@uspto.gov

Search Notes

Dear Scott Beliveau,

Please find attached the search results for 09525412. I used the search strategy I emailed to you to edit, which you did. I searched the standard Dialog files, IBM TDBs, IEEE, Inspec, and the internet.

If you would like a re-focus please let me know.

Thank you.

Access DB# 141675

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name Scott Beliveau Examiner #: 79346 Date: 1/4/05

Art Unit: 2614 Phone Number _____ Serial Number: 09/525412

Location: MR 6C41 Results Format Preferred (circle): (PAPER) DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Media Interface Device

Inventors (please provide full names): Steve Sheppard William Weeks Thomas Eames Charles Florig

Earliest Priority Filing Date: 2/19/97

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Looking for a "Residential gateway" That has a local interface (IR, UHF) to accept a Command (input) Command from a Remote control in close proximity and from those from Remote locations

he has residential gateway

* * → he wants a gateway with a IR port or UHF & accepting remote control commands.

****

STAFF USE ONLY

Searcher: Pamela Reynolds

Searcher Phone #: 306-0295

Searcher Location: PK2 3C03

Date Searcher Picked Up: 1-5-05 10:00

Date Completed: 1-5-05 2:00

Searcher Prep & Review Time: 20

Clerical Prep Time: _____

Online Time: 100

Type of Search → Set top box

Sequence (#)		STN	
AA Sequence (#)		Dialog	✓
Structure (#)		Questel/Orbit	
Bibliographic	✓	Dr.Link	
Litigation		Lexis/Nexis	
Fulltext	✓	Sequence Systems	
Patent Family		WWW/Internet	✓
Other		Other (specify)	

Vendors and cost where applicable

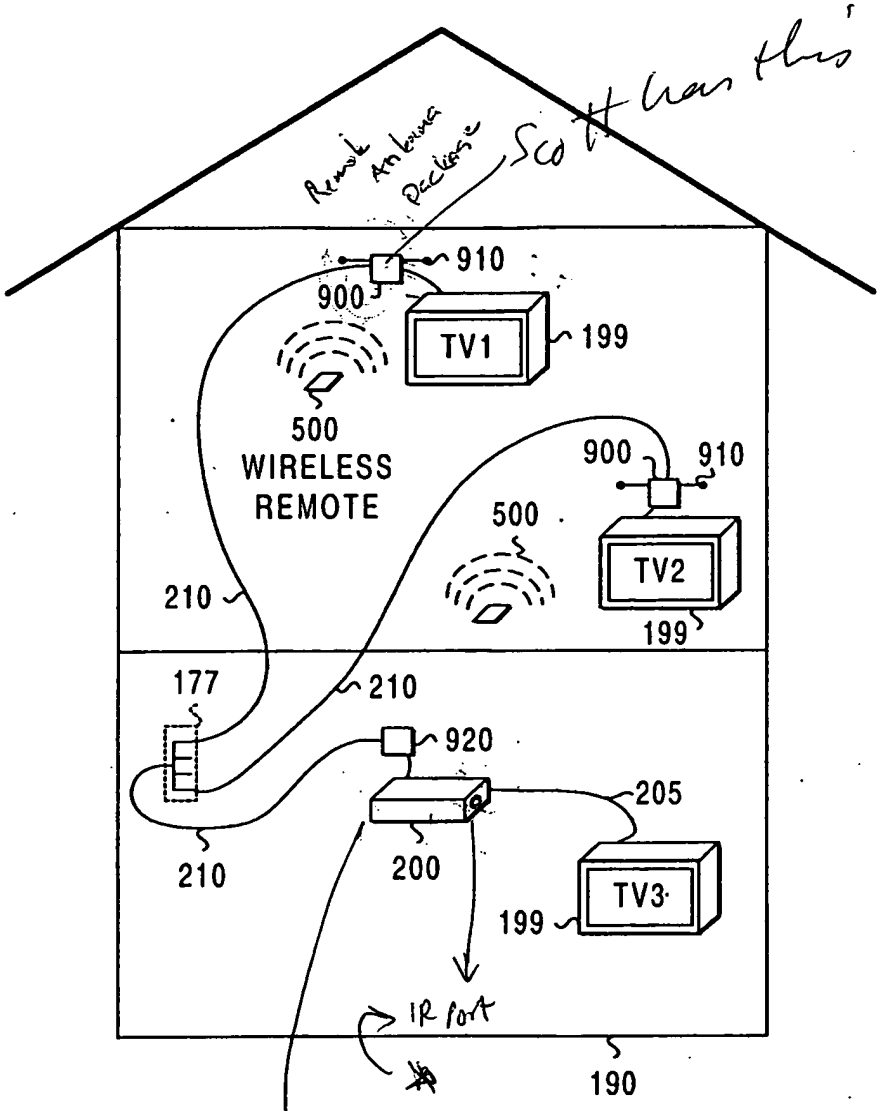

910
900
TV1
199
500
WIRELESS
REMOTE
900
910
500
TV2
199
210
177
210
920
205
210
200
TV3
199
IR port
190

FIG. 6

File 344:Chinese Patents Abs Aug 1985-2004/May
(c) 2004 European Patent Office
File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)
(c) 2004 JPO & JAPIO
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200482
(c) 2004 Thomson Derwent

Set	Items	Description
S1	68	RESIDENTIAL(3N)GATEWAY
S2	1265	LOCAL(3N)INTERFACE?
S3	290556	IR OR UHF OR INFRARED OR WIRELESS OR RF OR RADIO()FREQUENC?
S4	4343	(ACCEPT? OR RECIEV?)(3N)(COMMAND?? OR DIRECTION? OR INPUT)
S5	42453	(CHANG? OR SWITCH? OR SELECT?)(3N)CHANNEL?
S6	86216	REMOTE(3N)CONTROL?
S7	9550	CLOSE(3N)PROXIMIT?
S8	1	REMOTE(3N)ANTENNA()PACKAGE
S9	389745	REMOTE(3N)(PROXIMIT? OR LOCATION?) OR NETWORK?
S10	414507	CABLE??
S11	373930	TV OR TELEVISION
S12	838189	IC=H04N?
S13	2	S1 AND (S4 OR S5) AND S3
S14	1	S13 NOT S8
S15	0	S14 NOT PY=>1998
S16	3517	S9 AND S10 AND S11
S17	3	S16 AND S7
S18	3	S17 NOT (S13 OR S14)
S19	0	S18 NOT PY=>1998
S20	52	S2 AND S6
S21	1	S20 AND S9 AND S10 AND S11
S22	1	S21 NOT (S13 OR S17)
S23	0	S22 NOT PY=>1998
S24	17	S1 AND S3
S25	4	S24 AND S10
S26	5	S24 AND S11
S27	8	S25 OR S26
S28	6	S27 NOT (S21 OR S13 OR S17)
S29	0	S28 NOT PY=>1998

8/3,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014447234 **Image available**
WPI Acc No: 2002-267937/200231
Related WPI Acc No: 1998-467920
XRPX Acc No: N02-208404

Apparatus to transmit wireless signals over media such as video, data and telephony services to multiple devices using a residential gateway to convert and transmit signals

Patent Assignee: NEXT LEVEL COMMUNICATIONS (NEXT-N); NEXT LEVEL COMMUNICATIONS INC (NEXT-N)
Inventor: MCINNIS A J; SHEPPARD S; SWISHER J L; WEEKS B
Number of Countries: 096 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200169933	A1	20010920	WO 2001US8284	A	20010315	200231 B
AU 200145752	A	20010924	AU 200145752	A	20010315	200231
NO 200204401	A	20021114	WO 2001US8284	A	20010315	200305
			NO 20024401	A	20020913	
EP 1300018	A1	20030409	EP 2001918706	A	20010315	200325
			WO 2001US8284	A	20010315	

Priority Applications (No Type Date): US 2000526100 A 20000315; US 2000525412 A 20000315; US 2000525488 A 20000315
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200169933	A1	E	79	H04N-007/18	
	Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW				
	Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW				
AU 200145752	A			H04N-007/18	Based on patent WO 200169933
NO 200204401	A			H04N-000/00	
EP 1300018	A1	E		H04N-007/18	Based on patent WO 200169933
	Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR				

Abstract (Basic):
... A **remote antenna package** (900) and a **remote** antenna module (920) are used for communication between a residential gateway (200) and remote TVs...
... **Remote antenna package** (900
?

```
File   2:INSPEC 1969-2004/Dec W2
         (c) 2004 Institution of Electrical Engineers
File   6:NTIS 1964-2004/Dec W4
         (c) 2004 NTIS, Intl Cpyrght All Rights Res
File   8:Ei Compendex(R) 1970-2005/Dec W4
         (c) 2005 Elsevier Eng.  Info. Inc.
File  34:SciSearch(R) Cited Ref Sci 1990-2004/Dec W4
         (c) 2004 Inst for Sci Info
File  35:Dissertation Abs Online 1861-2004/Dec
         (c) 2004 ProQuest Info&Learning
File  65:Inside Conferences 1993-2004/Dec W4
         (c) 2004 BLDSC all rts. reserv.
File  94:JICST-EPlus 1985-2004/Nov W4
         (c)2004 Japan Science and Tech Corp(JST)
File  95:TEME-Technology & Management 1989-2004/Jun W1
         (c) 2004 FIZ TECHNIK
File  99:Wilson Appl. Sci & Tech Abs 1983-2004/Nov
         (c) 2004 The HW Wilson Co.
File 144:Pascal 1973-2004/Dec W1
         (c) 2004 INIST/CNRS
File 239:Mathsci 1940-2004/Feb
         (c) 2004 American Mathematical Society
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
         (c) 1998 Inst for Sci Info
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
         (c) 2002 The Gale Group
File 603:Newspaper Abstracts 1984-1988
         (c)2001 ProQuest Info&Learning
File 483:Newspaper Abs Daily 1986-2004/Dec 31
         (c) 2005 ProQuest Info&Learning

Set     Items   Description
S1        238   RESIDENTIAL(3N)GATEWAY
S2       2295   (SETTOP OR SET()TOP)(3N)(BOX OR UNIT??)
S3       6147   LOCAL(3N)INTERFACE?
S4    1587607   IR OR UHF OR INFRARED OR WIRELESS OR RF OR RADIO()FREQUENC?
S5       4132   (ACCEPT? OR RECIEV?)(3N)(COMMAND?? OR DIRECTION? OR INPUT)
S6      43874   (CHANG? OR SWITCH? OR SELECT?)(3N)CHANNEL?
S7      48454   REMOTE(3N)CONTROL?
S8      19503   CLOSE(3N)PROXIMIT?
S9          0   REMOTE(3N)ANTENNA()PACKAGE
S10   2331679   REMOTE(3N)(PROXIMIT? OR LOCATION?) OR NETWORK?
S11    308226   CABLE??
S12    622357   TV OR TELEVISION
S13      1803   AU=(SHEPPARD, S? OR WEEKS, B? OR SHEPPARD S? OR WEEKS B?)
S14         5   S1 AND S3 AND S4
S15         0   S14 AND S5
S16         0   S14 AND S7 AND S8
S17         5   S14 AND (S7 OR S8 OR S10)
S18         5   S17 AND PY=>1998
S19         0   S17 NOT PY=>1998
S20         3   RD S18 (unique items)
S21        53   S7 AND (S5 OR S6) AND S4
S22         0   S21 AND (S1 OR S2)
S23         0   S21 AND GATEWAY
S24         0   S21 AND S3
S25         7   S21 AND S10
S26         7   S25 NOT S14
S27         7   S26 NOT PY=>1998
S28         5   RD S27 (unique items)
```

S29	0	S13 AND S3
S30	0	S13 AND (S1 OR S2)
S31	2	S13 AND S12
S32	2	RD S31 (unique items)
S33	0	S32 NOT (EMERGENCY OR RECOVERY OR OPHTHAL?)

20/3,K/1 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

06361573 E.I. No: EIP03177444090
Title: A comparison of competing broadband in home technologies
Author: Zahariadis, Theodore; Pramataris, Kostas; Zervos, Nikolaos
Corporate Source: Bell Laboratories EMEA/Ellemedia, Athens 17121, Greece
Source: IETE Technical Review (Institution of Electronics and Telecommunication Engineers, India) v 19 n 6 November/December 2002. p 367-376
Publication Year: 2002
CODEN: ITREEI ISSN: 0256-4602
Language: English

Abstract: Connecting each house to a broadband access **network** represents an unprecedented opportunity to offer added-value services and broadband internet access to residential users and expand the customer base beyond the corporate environment. Home **networks** , however, may be the last barrier to end-to-end multimedia service provisioning. Although a large number of houses have PCs, modems or multimedia **network** -enabled appliances, the majority are not equipped to support their interconnection, and most consumers are unwilling or cannot afford large-scale home rewiring. This paper reviews the available home- **networking** technologies and provides a comparison of the competing broadband in-home technologies. The focus is...

...technologies that do not require rewiring the home, either reusing the existing wiring or using **wireless** technology. The paper also discusses the **residential gateway** (RG) initiative, which provides a single point of convergence between the in-home and the access **networks** . 13 Refs.
Descriptors: *Broadband **networks** ; Interconnection **networks** ; **Wireless** telecommunication systems; **Local** area **networks** ; **Interfaces** (computer); Gateways (computer **networks**); Interoperability; Quality of service

20/3,K/2 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07550237 Genuine Article#: 179WF No. References: 19
Title: A newly emerging customer premises paradigm for delivery of network **-based services**
Author(s): Waring DL (REPRINT) ; Kerpez KJ; Ungar SG
Corporate Source: BELLCORE,445 S ST/MORRISTOWN//NJ/07960 (REPRINT)
Journal: COMPUTER NETWORKS-THE INTERNATIONAL JOURNAL OF COMPUTER AND TELECOMMUNICATIONS NETWORKING, **1999** , V31, N4 (FEB 25), P411-424
ISSN: 1389-1286 Publication date: 19990225
Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

Title: A newly emerging customer premises paradigm for delivery of network **-based services**
, **1999**
Abstract: Low-speed home **networks** in some form are used for lighting, appliance control and security systems in over 20...

...increasing penetration of personal computers (PCs) is leading to early deployment of twisted-pair Ethernet **networks** by information industry employees and early technology adopters. Digital video has matured to the point...
...the context of a single-user device with full capability, increasing use of advanced digital **networks** in the home is the more likely evolution, with devices optimized for their particular task easily connecting to a whole-house **network** through attractive wall plates, by **wireless** , or through their commercial a.c. power cords. Several industries are formulating such concepts, examining advanced broadband digital **networks** with ''plug-and-play'' capabilities. For **network** service providers competing in an increasingly unregulated environment, success of service delivery will come to...

...paradigm of ''customer premises equipment'' which was relatively well defined, specified and controlled by the **network** operator will give way to home **networks** which are extremely sophisticated in their own right. Service providers will be forced to think in terms of delivering services into this **local** environment, with an **interface** which is more driven by the customer's local deployment decisions, somewhat analogous to the...

...and private lines to PBXs and gareways. This paper will examine the trends in home **networking** , and propose architectures which service providers can use to deliver services to, and across, home **networks** , to end-user devices. We will discuss recent industry activity focused on the concept of a **residential gateway** (RG), an electronic device which mediates between different service-provider access **networks** and different devices and **networks** within the home. We will discuss how the RG can facilitate intelligent testing capabilities to...

20/3,K/3 (Item 1 from file: 95)

01767170 20030608456
A real-time voice service with the adaptive packet loss recovery scheme in the hybrid residential gateway **system**
Park Kwangroh; Oh Yeunjoo; Lim Kyungshik; Cho Kyoungrok
Dept. of Embedded Software Technol., Electron. a. Telecommun. Res. Inst. (ETRI), Taejon, ROK
IEEE Transactions on Consumer Electronics, v49, n2, pp359-366, **2003**
Document type: journal article Language: English
Record type: Abstract
ISSN: 0098-3063

A real-time voice service with the adaptive packet loss recovery scheme in the hybrid residential gateway **system**
2003

ABSTRACT:
...on the H.323 protocol, which is one of the service functionalities of the hybrid **residential gateway** system. The proposed scheme analyzes the characteristics of packet losses based on the Gilbert model...

...of redundant data, with a constraint of minimizing the bandwidth consumption of links. Since the **wireless** environments could be often

characterized by frequent and consecutive packet losses, loss recovery mechanisms need...

...of the mechanism, we extended and implemented RTP/RTCP protocols and applications in the hybrid **residential gateway** system. The experimental results show that our mechanism, with exponential offset, achieves remarkably low complete...

...and adapts dynamically to the fluctuation of the packet loss pattern in the wired and **wireless** environments.
DESCRIPTORS: ADAPTIVE SYSTEM; BROADBAND **NETWORKS** ; CLIENT SERVER SYSTEMS; COMMUNICATION PROTOCOLS; VOICE COMMUNICATION; LONG DISTANCE **NETWORKS** ; **WIRELESS** LAN; LAN...

... **LOCAL** AREA **NETWORKS** ; COMPUTER **INTERFACES**
?

28/3,K/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

5855535 INSPEC Abstract Number: B9804-6250F-158
Title: Transmitter macrodiversity in radio fibre microcellular networks
Author(s): Rivas, I.; Lopes, L.B.
Author Affiliation: Dept. of Electron. & Electr. Eng., Leeds Univ., UK
Conference Title: Waves of the Year 2000+ PIMRC '97. The 8th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications. Technical Program, Proceedings (Cat. No.97TH8271) Part vol.3 p.1074-8 vol.3
Publisher: IEEE, New York, NY, USA
Publication Date: 1997 Country of Publication: USA 3 vol. xviii+1232 pp.
ISBN: 0 7803 3871 5 Material Identity Number: XX97-02509
U.S. Copyright Clearance Center Code: 0 7803 3871 5/97/$10.00
Conference Title: Proceedings of 8th International Symposium on Personal, Indoor and Mobile Radio Communications - PIMRC '97
Conference Sponsor: IEEE Commun. Soc.; IEEE Commun. Chapter in Finland; IEEE Finland Sect.; IEE; IEICE
Conference Date: 1-4 Sept. 1997 Conference Location: Helsinki, Finland
Language: English
Subfile: B

Title: Transmitter macrodiversity in radio fibre microcellular networks
Abstract: Radio-fibre microcellular **networks** are composed by small-size cells that make use of a fibre optic **network** for the conveyance of **RF** signals from a central **controller** to **remote** antennae at cellsite. This structure is particularly suitable to accomplish receiver and transmitter macrodiversity since the same **RF** channel can be transmitted and received through multiple ports, thus providing a large coverage area in which mobiles do not have to **switch channels** when roaming. This paper investigates the performance of multitransmitter diversity in fading channels, in noise...
...Descriptors: optical fibre **networks** ;
...Identifiers: radio fibre microcellular **networks** ; ...

...fibre optic **network** ; ...

... **RF** signals

28/3,K/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

03154034 INSPEC Abstract Number: B88042843, C88033790
Title: Installation: distribution, remote control **and quality of electricity**
Author(s): Gaspar, M.; Matinal, C.
Journal: Journal de L'Equipment Electrique et Electronique no.566 p.17-19
Publication Date: 7 March 1988 Country of Publication: France
CODEN: JEEEAP ISSN: 0758-3826
Language: French
Subfile: B C

Title: Installation: distribution, remote control **and quality of electricity**
...Abstract: authors explain the installation of luminaires, partitions and switches for the lighting of offices with **remote control** by **infrared** encoded transmissions from battery-powered sources. Wiring for office machines and telecommunications is discussed with...

... conduits and distribution columns finished in anodised aluminium with segregated light-current and heavy-current **channels** . Proprietary **switches** and other products for heavy-current cabinets are listed. The authors also highlight the importance of clean power supplies with emergency invertors either in a specific office **network** or in close proximity to particular machines which need protected memory. Such installations are related...
...Descriptors: distribution **networks** ;
...Identifiers: **remote control** ; ...

... **infrared** encoded transmissions

28/3,K/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

02952523 INSPEC Abstract Number: B87056500, C87046703
Title: Network **-C tester CMT**
Author(s): Maucksch, T.
Journal: News from Rohde and Schwarz vol.26, no.115 p.16-19
Publication Date: 1986 Country of Publication: West Germany
CODEN: NROSAE ISSN: 0028-9108
Language: English
Subfile: B C

Title: Network **-C tester CMT**
Abstract: In the **network** -C tester Rohde & Schwarz offers a low-cost, compact test set which combines the superior...

... the capability of measuring the switching-oriented parameters of radiotelephone equipment, i.e. testing a **network** -C radiotelephone for system conformity and performance characteristics. It is able to simulate a base station in **network** C so that, in addition to measuring the **RF** and AF parameters on a mobile phone, it can test call setup, holding of the speech connection, **channel** and power **change** as well as call cleardown. The test set provides important standard sequences so that a...
... facilities available for the basic model can of course also be used for checking a **network** -C mobile phone. The **remote - control** interface and especially the learn mode of the CMT permit parameters specific to **network** C to be combined in one test sequence.
Identifiers: CMT **network** -C tester...

... **RF** parameters...

... **remote - control** interface

28/3,K/4 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS

1984194 NTIS Accession Number: AD-A315 285/7
Research Problems in Wireless **Communication** Networks
(Progress rept. 1 Nov 94-31 Dec 95)
Tassiulas, L.
Polytechnic Univ., Brooklyn, NY.
Corp. Source Codes: 088687000; 416617
Report No.: AFOSR-TR-96-0447
15 Jul 96 34p
Languages: English
Journal Announcement: GRAI9704
Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A04/MF A01

Research Problems in Wireless **Communication** Networks
The work performed under the support of the aforementioned AFOSR grant includes research on terrestnal **wireless** access system and satellite **networks** . In a terrestrial **network** , a multlayer cellular architecture was investigated. It consists of layers with dense frequency reuse for mobiles dose to base statons and with sparser frequency reuse for **remote** mobiles. Channel **control** schemes that increase the spectrum utlization were proposed and studied. In the digital **wireless** systems of the near future, a mobile terminal will have control over the transmission power, **channel selection** and base station assignment. Control algorithms that compute and assign all those quantities in order...

...can significantly increase the performance of the system. The problem of management and control in **networks** with time varying topology as it arises in low earth orbit satellite **networks** was studied. Control policies that use predictions of the **network** topology evolution were proposed and studied. The magnitude of improvement in the performance using predictive...
Descriptors: *Communications **networks** ; *Satellite communications; *Satellite **networks** ; Frequency; Military facilities; Optimization; Policies; Management; Variations; Transmittance; Solutions(General); Topology; High density; Evolution(General); Allocations; Power; Architecture; Earth(Planet); **Channels** ; Radio stations; **Channel selectors**
Identifiers: ***Wireles** s communications **networks** ; NTISDODXA; NTISDODAF

28/3,K/5 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02070649 E.I. Monthly No: EIM8602-007912
Title: IMPROVING UNDERGROUND RADIO COMMUNICATIONS AND USE OF RF **SIMULCAST** NETWORKS **IN RAPID TRANSIT OPERATIONS.**
Author: Austin, Gregory E.
Corporate Source: Bay Area Rapid Transit District, Oakland, CA, USA
Conference Title: 35th IEEE Vehicular Technology Conference: Efficiency, Conservation and Productivity.
Conference Location: Boulder, CO, USA Conference Date: 19850521
E.I. Conference No.: 07566

Source: IEEE Vehicular Technology Conference 35th. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (Cat n 85CH2037-0), Piscataway, NJ, USA p 279-284
Publication Year: 1985
CODEN: IVTCDZ ISSN: 0740-0551
Language: English

Title: IMPROVING UNDERGROUND RADIO COMMUNICATIONS AND USE OF RF **SIMULCAST** NETWORKS **IN RAPID TRANSIT OPERATIONS.**

...Abstract: BART) undertook a major radio improvement project to add new radio channels to its VHF/ **UHF network** , including setting up three synchrocast (simulcasting) **networks** and changing the communications consoles at BART's Central Control to an electronic matrix switching...

...to talk to each other with portable radios and to selected surface units via a **remote control** box. In the aboveground improvement program, BART has installed three synchrocast **networks** on two VHF and one **UHF** channel for operations in four counties. BART is planning to install an electronic matrix switching...

...Descriptors: Communication **Channels** ; **SWITCHING** SYSTEMS...
Identifiers: **RF** SIMULCAST **NETWORKS** ; UNDERGROUND RADIO CHANNELS; BAY AREA RAPID TRANSIT (BART); ELECTRONIC MATRIX SWITCHING SYSTEM
?

```
File 344:Chinese Patents Abs Aug 1985-2004/May
         (c) 2004 European Patent Office
File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)
         (c) 2004 JPO & JAPIO
File 348:EUROPEAN PATENTS 1978-2004/Dec W03
         (c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20041230,UT=20041223
         (c) 2004 WIPO/Univentio
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200482
         (c) 2004  Thomson Derwent

Set     Items   Description
S1        127   AU=(SHEPPARD, S? OR WEEKS, B? OR SHEPPARD S? OR WEEKS B?)
S2          2   S1 AND MEDIA()INTERFACE
```

2/5,K/1 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00836236 **Image available**

METHOD AND APPARATUS FOR TRANSMITTING WIRELESS SIGNALS OVER MEDIA
PROCEDE ET DISPOSITIF PERMETTANT DE TRANSMETTRE DES SIGNAUX SANS FIL SUR DES SUPPORTS

Patent Applicant/Assignee:
NEXT LEVEL COMMUNICATIONS, 6085 State Farm Drive, Rohnert Park, CA 94928, US, US (Residence), US (Nationality), (For all designated states except: US)
Patent Applicant/Inventor:
SHEPPARD Steve , 7170 Lynch Road, Sebastopol, CA 95472, US, US (Residence), US (Nationality), (Designated only for: US)
MCINNIS A J, 3709 Espresso Court, Santa Rosa, CA 95403, US, US (Residence), US (Nationality), (Designated only for: US)
WEEKS Bill , 392 Windmill Lane, Petaluma, CA 94954, US, US (Residence), US (Nationality), (Designated only for: US)
SWISHER James L, 1949 Terry Road, Santa Rosa, CA 95403, US, US (Residence), US (Nationality), (Designated only for: US
Legal Representative:
TING Henry P (et al) (agent), Covington & Burling, 1201 Pennsylvania Avenue, NW, Washington, DC 20004, US,

Patent and Priority Information (Country, Number, Date):
Patent: WO 200169933 A1 20010920 (WO 0169933)
Application: WO 2001US8284 20010315 (PCT/WO US0108284)
Priority Application: US 2000526100 20000315; US 2000525412 20000315; US 2000525488 20000315
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: H04N-007/18
Publication Language: English
Filing Language: English
Fulltext Availability:
Detailed Description
Claims
Fulltext Word Count: 14593

English Abstract
A residential gateway (RG) (200) for distributing video, data and telephony services to multiple devices within a residence is disclosed. The RG (200) receives signals from a telecommunications network, converts the signals to formats compatible with the multiple devices, and transmits the appropriate signals to the appropriate devices. Wireless remote control devices associated with the remotely located televisions (TVs) (199) transmit channel select commands as wireless signals to the RG (200). The wireless signals are received by a Remote Antennae Package (RAP) (900) that transmits the wireless signal over cable. A remote Antennae Module (RAM) (920) receives the wireless signal and extracts the

channel select command.

French Abstract
L'invention concerne une passerelle residentielle (200) permettant de distribuer des services video, des services d'acces aux donnees et des services telephoniques a plusieurs dispositifs d'une residence. La passerelle (200) recoit les signaux transmis par un reseau de telecommunication, converti ces signaux dans des formats compatibles avec les divers dispositifs, puis elle transmet les signaux appropries aux dispositifs appropries. Des dispositifs de commande a distance sans fil, associes aux televisions placees a distance (199), transmettent a la passerelle residentielle (200) des commandes de selection de canal sous la forme de signaux sans fil. Les signaux sans fil sont recus par un ensemble d'antennes a distance (900) qui transmet par cable le signal sans fil. Un module d'antennes a distance (920) recoit le signal sans fil et extrait la commande de selection de canal.

Legal Status (Type, Date, Text)
Publication 20010920 A1 With international search report.
Examination 20011206 Request for preliminary examination prior to end of 19th month from priority date

Patent Applicant/Inventor:
SHEPPARD Steve ...

...Designated only for: US)
WEEKS Bill ...
Fulltext Availability:
Detailed Description
Claims

Detailed Description
... 3
and the telecom network will be transmitted over the same media. As such, a **media interface** device is disclosed for enabling multiple TV channels and telecom data to be transmitted over...and
various other components, according to one embodiment;
Fig. 16 illustrates the components of a **Media Interface** Device (MID), according to one embodiment; and
Fig. 17 illustrates the housing of the MID...be replaced by a single device, in an alternative embodiment.

The alternative embodiment utilizes a **Media Interface** Device (MID) 800, such as a coaxial interface device, that includes the combiner 802, the...

Claim
... from the RF transmitters includes:
transmitting the RF signals from the RF transmitters to a **media interface** device over the media, the media connecting the remotely located televisions to the **media interface** device;
receiving the RF signals at the **media interface** device;
extracting the channel select commands from the RF signals received at the **media interface** device; and
33
transmitting the channel select commands from the **media interface** device to the residential gateway.

62 The **media interface** device of claim 61, wherein the first signal is a TV signa 1, the second...

...from the residential gateway, and the second direction is toward the residential gateway.

63 A **media interface** device for connecting to a residential gateway and distributing signals to and from the residential gateway over a media, the **media interface** comprising:
a first connector for receiving and transmitting signals over a media, the received signals...

...the wireless
signals and transmitting the channel select commands to the residential gateway.

64 The **media interface** device of claim 63, further comprising an X by Y splitter and X-1 additional...

2/5,K/2 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014447234 **Image available**
WPI Acc No: 2002-267937/200231
Related WPI Acc No: 1998-467920
XRPX Acc No: N02-208404

Apparatus to transmit wireless signals over media such as video, data and telephony services to multiple devices using a residential gateway to convert and transmit signals

Patent Assignee: NEXT LEVEL COMMUNICATIONS (NEXT-N); NEXT LEVEL COMMUNICATIONS INC (NEXT-N)
Inventor: MCINNIS A J; **SHEPPARD S** ; SWISHER J L; **WEEKS B**
Number of Countries: 096 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200169933	A1	20010920	WO 2001US8284	A	20010315	200231	B
AU 200145752	A	20010924	AU 200145752	A	20010315	200231	
NO 200204401	A	20021114	WO 2001US8284	A	20010315	200305	
			NO 20024401	A	20020913		
EP 1300018	A1	20030409	EP 2001918706	A	20010315	200325	
			WO 2001US8284	A	20010315		

Priority Applications (No Type Date): US 2000526100 A 20000315; US 2000525412 A 20000315; US 2000525488 A 20000315
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200169933	A1	E	79	H04N-007/18	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200145752	A		H04N-007/18	Based on patent WO 200169933
NO 200204401	A		H04N-000/00	
EP 1300018	A1	E	H04N-007/18	Based on patent WO 200169933

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

Abstract (Basic): WO 200169933 A1

NOVELTY - A remote antenna package (900) and a remote antenna module (920) are used for communication between a residential gateway (200) and remote TVs (199) and channel selection commands are received by the antenna (910) as wireless signals, transmitted over a coaxial cable (210) to the antenna module, extracting channel selection commands and transmitting them to the gateway. The gateway converts signals into formats suitable for the multiple devices.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for a method of distributing video signals from a residential gateway, for a gateway, for a method for receiving and decoding signals from a telecommunication network, for an optical conversion device and for a **media interface** device.

USE - Transmitting wireless signals over media.

ADVANTAGE - Ensuring gateway receives channel selection commands from TVs.

DESCRIPTION OF DRAWING(S) - The drawing shows the residential gateway configuration

Remote antenna package (900)

Remote antenna module (920)

Residential gateway (200)

Antenna (910)

pp; 79 DwgNo 9/17

Title Terms: APPARATUS; TRANSMIT; WIRELESS; SIGNAL; MEDIUM; VIDEO; DATA; TELEPHONE; SERVICE; MULTIPLE; DEVICE; RESIDENCE; GATEWAY; CONVERT; TRANSMIT; SIGNAL

Derwent Class: W01; W02; W03

International Patent Class (Main): H04N-000/00; H04N-007/18

File Segment: EPI

...Inventor: **SHEPPARD S** ...

... **WEEKS B**

Abstract (Basic):

... and decoding signals from a telecommunication network, for an optical conversion device and for a **media interface** device...

?

```
File 344:Chinese Patents Abs Aug 1985-2004/May
         (c) 2004 European Patent Office
File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)
         (c) 2004 JPO & JAPIO
File 348:EUROPEAN PATENTS 1978-2004/Dec W03
         (c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20041230,UT=20041223
         (c) 2004 WIPO/Univentio
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200482
         (c) 2004  Thomson Derwent

Set     Items   Description
S1        127   AU=(SHEPPARD, S? OR WEEKS, B? OR SHEPPARD S? OR WEEKS B?)
S2          2   S1 AND MEDIA()INTERFACE
```

File 348:EUROPEAN PATENTS 1978-2004/Dec W03
(c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20041230,UT=20041223
(c) 2004 WIPO/Univentio

Set	Items	Description
S1	208	RESIDENTIAL(3N)GATEWAY
S2	5621	LOCAL(3N)INTERFACE?
S3	298877	IR OR UHF OR INFRARED OR WIRELESS OR RF OR RADIO()FREQUENC?
S4	13769	(ACCEPT? OR RECIEV?)(3N)(COMMAND?? OR DIRECTION? OR INPUT)
S5	34507	(CHANG? OR SWITCH? OR SELECT?)(3N)CHANNEL?
S6	32586	REMOTE(3N)CONTROL?
S7	47729	CLOSE(3N)PROXIMIT?
S8	0	REMOTE(3N)ANTENNA()PACKAGE
S9	247703	REMOTE(3N)(PROXIMIT? OR LOCATION?) OR NETWORK?
S10	158741	CABLE??
S11	83609	TV OR TELEVISION
S12	60093	IC=H04N?
S13	0	S1(S)S3(S)S7(S)S8
S14	0	S1(S)S7(S)S8
S15	38	S6(S)S7(S)S9
S16	14	S15(S)S10
S17	7	S16 AND S12
S18	2	S17 NOT PY=>1998
S19	2	IDPAT (sorted in duplicate/non-duplicate order)
S20	2	IDPAT (primary/non-duplicate records only)
S21	57	S1(S)S11
S22	21	S21 AND S12
S23	21	S22 NOT S17
S24	0	S23 NOT PY=>1998
S25	19	S1(S)(S4 OR S5)
S26	1	S25(S)S7(S)S9
S27	0	S26 NOT (S22 OR S17)

20/3,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00824589
Arrangement for billing interactive communication services
Abrechnungsmittel fur interaktive Kommunikationsdienstleistungen
Moyens de facturation de services de communication interactifs
PATENT ASSIGNEE:
AT&T Corp., (589370), 32 Avenue of the Americas, New York, NY 10013-2412, (US), (applicant designated states: DE;ES;FR;GB;NL;SE)
INVENTOR:
Chen, Howard Zehua, 604 Mountain Avenue, Berkeley Heights, New Jersey 07922, (US)
LEGAL REPRESENTATIVE:
Johnston, Kenneth Graham et al (32381), Lucent Technologies (UK) Ltd, 5 Mornington Road, Woodford Green Essex, IG8 OTU, (GB)
PATENT (CC, No, Kind, Date): EP 766475 A1 970402 (Basic)
APPLICATION (CC, No, Date): EP 96306746 960917;
PRIORITY (CC, No, Date): US 534903 950928
DESIGNATED STATES: DE; ES; FR; GB; NL; SE
INTERNATIONAL PATENT CLASS: **H04N-007/173** ; **H04N-007/16**
ABSTRACT WORD COUNT: 284

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	EPAB97	1047
SPEC A	(English)	EPAB97	5699
Total word count - document A			6746
Total word count - document B			0
Total word count - documents A + B			6746

INTERNATIONAL PATENT CLASS: **H04N-007/173** ...

... **H04N-007/16**

...SPECIFICATION multitude of channels at any moment of time, such as by means of an infrared **remote - control** device that is presently used to control the programs being displayed on TV sets, video...

...Each of the channels typically carries a "program" or other form of information. The infrared **remote - control** device sends a coded infrared request signal to a set-top box advantageously located in **close proximity** to the TV set whose programs the set-top box controls. This set-top box...
...receives and then sends ("transponds") a resulting coded request signal via a link to a **remote control** receiver (hereinafter: " **remote controller** ") located in the curbside box. The **remote controller** decodes each such request signal, in order to produce a decoded signal that selects which...

...resulting selected channel is then sent to the house over a single fiber or coaxial **cable** . Moreover, in case of selection of a paid channel, the **remote controller** can also send billing information to an appropriate **remote** billing **location** , such as a **remote** billing center.
Each channel can be, for example, a free radio or a free TV...

20/3,K/2 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00824587
Curbside circuitry for interactive communication services
Vorfeldabschlussschaltung fur interaktive Kommunikationsdienstleistungen
Circuit de connexion avancee pour des services de communication interactifs
PATENT ASSIGNEE:
AT&T Corp., (589370), 32 Avenue of the Americas, New York, NY 10013-2412, (US), (applicant designated states: DE;ES;FR;GB;NL;SE)
INVENTOR:
Chen, Howard Zehua, 604 Mountain Avenue, Berkeley Heights, New Jersey 07922, (US)
Tai, King Lien, 95 Highland Circle, Berkeley Heights, New Jersey 07922, (US)
Johnson, Michael Gunnar, 114 Maxim Drive, Hopatcong, New Jersey 07843, (US)
LEGAL REPRESENTATIVE:
Buckley, Christopher Simon Thirsk et al (28912), Lucent Technologies, 5 Mornington Road, Woodford Green, Essex IG8 0TU, (GB)
PATENT (CC, No, Kind, Date): EP 766474 A1 970402 (Basic)
APPLICATION (CC, No, Date): EP 96306742 960917;
PRIORITY (CC, No, Date): US 534909 950928
DESIGNATED STATES: DE; ES; FR; GB; NL; SE
INTERNATIONAL PATENT CLASS: **H04N-007/173**
ABSTRACT WORD COUNT: 299

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	EPAB97	643
SPEC A	(English)	EPAB97	3554
Total word count - document A			4197
Total word count - document B			0
Total word count - documents A + B			4197

INTERNATIONAL PATENT CLASS: **H04N-007/173**

...SPECIFICATION multitude of channels at any moment of time, such as by means of an infrared **remote - control** device that is presently used to control the programs being displayed on TV sets, video...Each of the channels typically carries a "program" or other form of information. The infrared **remote - control** device sends a coded infrared request signal to a novel set-top box advantageously located in **close proximity** to the TV set whose programs the set-top box controls. This set-top box...
...receives and then sends ("transponds") a resulting coded request signal via a link to a **remote control** receiver (hereinafter: " **Remote Controller** ") located in the curbside box. The **Remote Controller** decodes each such request signal, in order to produce a decoded signal that selects which...

...resulting selected channel is then sent to the house over a single fiber or coaxial **cable** . Moreover, in case of selection of a paid channel, the **Remote Controller** can also send billing information to an appropriate **remote** billing **location** , such as a **remote** billing center.
In prior art, a conventional set-top box contains a Motion Picture

File 9:Business & Industry(R) Jul/1994-2005/Jan 04
(c) 2005 The Gale Group
File 15:ABI/Inform(R) 1971-2005/Jan 05
(c) 2005 ProQuest Info&Learning
File 16:Gale Group PROMT(R) 1990-2005/Jan 05
(c) 2005 The Gale Group
File 20:Dialog Global Reporter 1997-2005/Jan 05
(c) 2005 The Dialog Corp.
File 47:Gale Group Magazine DB(TM) 1959-2005/Jan 04
(c) 2005 The Gale group
File 75:TGG Management Contents(R) 86-2004/Dec W1
(c) 2004 The Gale Group
File 80:TGG Aerospace/Def.Mkts(R) 1982-2005/Jan 05
(c) 2005 The Gale Group
File 88:Gale Group Business A.R.T.S. 1976-2005/Jan 03
(c) 2005 The Gale Group
File 98:General Sci Abs/Full-Text 1984-2004/Sep
(c) 2004 The HW Wilson Co.
File 112:UBM Industry News 1998-2004/Jan 27
(c) 2004 United Business Media
File 141:Readers Guide 1983-2004/Sep
(c) 2004 The HW Wilson Co
File 148:Gale Group Trade & Industry DB 1976-2005/Jan 05
(c)2005 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
(c) 1999 The Gale Group
File 275:Gale Group Computer DB(TM) 1983-2005/Jan 05
(c) 2005 The Gale Group
File 264:DIALOG Defense Newsletters 1989-2005/Jan 04
(c) 2005 The Dialog Corp.
File 484:Periodical Abs Plustext 1986-2005/Jan W1
(c) 2005 ProQuest
File 553:Wilson Bus. Abs. FullText 1982-2004/Sep
(c) 2004 The HW Wilson Co
File 570:Gale Group MARS(R) 1984-2005/Jan 05
(c) 2005 The Gale Group
File 608:KR/T Bus.News. 1992-2005/Jan 05
(c)2005 Knight Ridder/Tribune Bus News
File 620:EIU:Viewswire 2005/Jan 04
(c) 2005 Economist Intelligence Unit
File 613:PR Newswire 1999-2005/Jan 03
(c) 2005 PR Newswire Association Inc
File 621:Gale Group New Prod.Annou.(R) 1985-2005/Jan 05
(c) 2005 The Gale Group
File 623:Business Week 1985-2004/Dec 27
(c) 2004 The McGraw-Hill Companies Inc
File 624:McGraw-Hill Publications 1985-2004/Dec 28
(c) 2004 McGraw-Hill Co. Inc
File 634:San Jose Mercury Jun 1985-2004/Dec 31
(c) 2005 San Jose Mercury News
File 635:Business Dateline(R) 1985-2005/Jan 05
(c) 2005 ProQuest Info&Learning
File 636:Gale Group Newsletter DB(TM) 1987-2005/Jan 05
(c) 2005 The Gale Group
File 647:CMP Computer Fulltext 1988-2005/Dec W3
(c) 2005 CMP Media, LLC
File 696:DIALOG Telecom. Newsletters 1995-2005/Jan 04
(c) 2005 The Dialog Corp.
File 674:Computer News Fulltext 1989-2004/Dec W2
(c) 2004 IDG Communications

File 810:Business Wire 1986-1999/Feb 28
(c) 1999 Business Wire
File 813:PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc
File 587:Jane`s Defense&Aerospace 2004/Dec W3
(c) 2004 Jane`s Information Group

Set	Items	Description
S1	6646	RESIDENTIAL(3N)GATEWAY
S2	12963	LOCAL(3N)INTERFACE?
S3	3350417	IR OR UHF OR INFRARED OR WIRELESS OR RF OR RADIO()FREQUENC?
S4	21734	(ACCEPT? OR RECIEV?)(3N)(COMMAND?? OR DIRECTION? OR INPUT)
S5	106107	(CHANG? OR SWITCH? OR SELECT?)(3N)CHANNEL?
S6	223734	REMOTE(3N)CONTROL?
S7	66115	CLOSE(3N)PROXIMIT?
S8	0	REMOTE(3N)ANTENNA()PACKAGE
S9	11007806	REMOTE(3N)(PROXIMIT? OR LOCATION?) OR NETWORK?
S10	2877785	CABLE??
S11	6832090	TV OR TELEVISION
S12	271	AU=(SHEPPARD, S? OR WEEKS, B? OR SHEPPARD S? OR WEEKS B?)
S13	0	S1(S)S12
S14	0	S1 AND S12
S15	1	S1(S)S2(S)S3
S16	0	S15 NOT PY=>1998
S17	11	S1(S)S3(S)S6
S18	0	S17(S)S7(S)S9
S19	0	S17(S)S7
S20	8	S17(S)S9
S21	0	S20 NOT PY=>1998
S22	0	S1(S)(S4 OR S5)(S)S7(S)S9
S23	7	S1(S)S7(S)S9
S24	7	S23 NOT S20
S25	0	S24 NOT PY=>1998
S26	218	S1(S)S10(S)S11
S27	124	S26(S)S9
S28	1	S27(S)S7
S29	0	S28 NOT PY=>1998

DataStar will not be available on Saturday, Jan 8th from 0400-1100gmt due to maintenance

Dialog DataStar

options | logoff | feedback | help

United States Patent and Trademark Office — An Agency of the United States Department of Commerce

sira — Search and Information Resources Administration

databases | search page

Titles

To view one or many selected titles scroll down the list and click the corresponding boxes. Then click display at the bottom of of the page. To view one particular document click the link above the title to display immediately.

Documents 1 to 3 of 3 from your search **"((residential ADJ gateway) AND network$3) AND television"** in all the available information:
Number of titles selected from other pages: 0

☐ **Select All**

☐ 1 display full document

2004. (INZZ) A study on a **residential gateway** for an Ethernet based **residential** multiservices **network.**

☐ 2 display full document

2002. (INZZ) Building the best **gateway.**

☐ 3 display full document

1996. (INZZ) The **residential gateway:** a home traffic cop.

Selection	Display Format	Output Format	ERA SM Electronic Redistribution & Archiving	Action
◉ from this page ○ from all pages	◉ Full ○ Free ○ Short ○ Medium ○ Custom Help with Formats	◉ HTML ○ Tagged (for tables) ○ PDF ○ RTF	Copies you will redistribute: [ ] Employees who will access archived record (s): [ ] Help with ERA	display save print preview
				order
Sort your entire search result by	Publication year	Ascending		sort

Top - News & FAQS - Dialog

viewpoint

Burgeoning competition in telecommunications is multiplying the number of communications paths into the home—but a standard multinetwork connection could sort them out

The residential gateway

CLIFFORD R. HOLLIDAY *B & C Consulting Services*

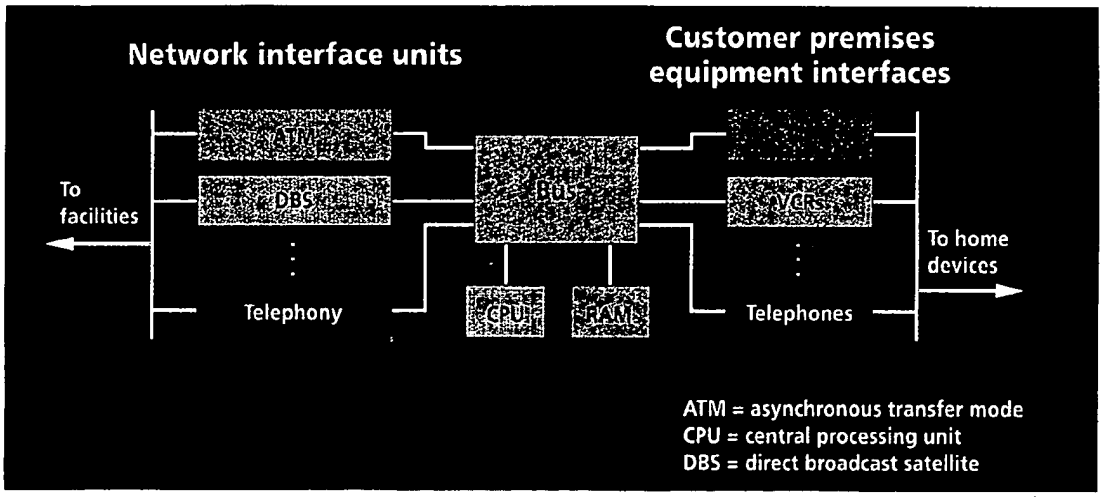
Around the world, deregulation of the telecommunications industry is unleashing competition among not only telephone carriers and cable TV services, but also utilities and other newcomers to the field. In the United States, with the passage of the 1996 Telecommunications Act, the deregulation that was already under way is accelerating and the formation of telco giants through megamergers is starting to change the industry's structure. For example, four of the former Regional Bell Operating companies—Bell Atlantic, Nynex, Pacific Bell, and Southwestern Bell—are now metamorphosing into two huge SuperBells.

A rush is also on for the various contenders to cross traditional boundaries seeking revenue streams in the previously forbidden-fruit areas of their new competitors. Already some of the conventional telco bypass companies—like MFS Communications and Cox Communications Inc.—are considering extensions from the business arena into the residential market. And relatively new entrants, the direct broadcast satellite (DBS) companies, are marketing their video-delivery services as a home entertainment product, and selling approximately 100 000 units per month—one of the most successful home entertainment products of all time.

What is currently missing from this mass of activity, however, is a "customercentric"—or a focus on the customer—approach to network design. A standard residential gateway could help put the customer back into the center of the picture.

Broadband networks proliferate

One effect of this stepped-up competition and the industry's structural change is the sudden emergence of, not one, but several actual and potential broadband communications networks into homes and small businesses. To an extent, these networks were originally spurred by telephone companies that wanted to offer interactive video services, but until recently were legally prevented from doing so. Whether



The residential gateway achieves its goal of hiding complexity by an adaptation of the classical personal computer design using a central processing unit and on-board RAM. A bus connects network interface units (NIUs) and customer premises equipment interfaces (CPIs). Among the NIUs available for installation on a one-for-one basis to match with the desired external networks will be asynchronous transfer mode, direct broadcast satellite, telephony, and cable television. The CPIs likewise will match the devices providing the services desired in the home, such as the television set, videocassette recorder, telephone, and computer.

Another view: Better a distributed than a centralized solution

Standardization is critical in the area of residential network interfaces, and it is important that such standardization be driven by the needs of the consumer, as in the residential gateway approach. But another approach being considered is to set up a peer-to-peer network architecture that does not constrain all signal delivery to one gateway device. Such a distributed solution would facilitate navigational software being put into the TV set, a personal computer, or an information appliance. Any one of these devices could then operate with particular sets of equipment in the home.

For example, one such set might comprise a VCR and the TV receiver. Another might be an information appliance with an RF input that could communicate power shedding commands over the in-home network to sheddable loads. A TV receiver in a PC could directly parse the RF multiplex and receive broadcasted software updates.

Many factors seem to favor the distributed approach. One is that multiple RF signals impinging upon the home are readily available. (Radio and TV signals can easily deliver many megabits per second of data along with programs. The same is true of multichannel multipoint distribution services [MMDS], local multipoint distribution services [LMDS], cellular and satellite signals, and so on.) Add to this availability the realities of consumer behavior (people buy services or features—not future capability), the abundance of wiring systems in the homes (coax, telephone wire), and the tolerance of consumers to failures (would you pay to set up a situation where a single failure takes out the whole house?). A residential gateway may be a cost-effective device for delivery of some of these services, but not all of them.

Moreover, examining the gateway approach specifically for centralized reception, control, and redistribution for off-air TV signals within a home exposes some important design issues. For instance, there is a large (at least 40-dB) dynamic range of the RF input signals across the channels. The gateway hardware must address this input range, which is a result of different transmitter locations with respect to the home and a fixed antenna gain in each direction for a residential gateway antenna. In addition, the amount of RF loss through the in-home coaxial distribution cables varies over the wide frequency band (~750 MHz) and by varying run lengths (from 3 meters to 90 meters). These can easily add another 20 dB of variation in signal strength.

Also, if there are internal video sources to be distributed around the home, the total variation is worse. For good quality, the RF output level at the wall outlets must all be at least 0 dBmV (75 ohms). However, the level cannot exceed 15.5 dBmV and still comply with U.S. rules. (Worldwide, high wall plate signal levels can cause ghosts in broadcast signal reception and therefore should be avoided, even if the level is not regulated.) The cost for the amplifiers, filters, and attenuators to squeeze 55–60 dB of dynamic range into a particular 15-dB range can be substantial, and such a system requires much skill to install.

By contrast, a distributed RF delivery system has antennas for each set and perhaps a rotatable roof-top antenna, both of which enable consumers to make the most of the set in use. Consumer receivers can handle input signals that are stronger than 15.5 dBmV and have wide dynamic ranges, so there is less optimization required with direct antenna system connections—and little or no additional cost to the consumer. It is hard to believe that paying for a gateway and getting less, or even the same, functionality will be acceptable.

Other problems can further complicate the electronics in any centralized residential gateway hardware. One of these is contention for the frequency band. If a cable system is present, there will be cable channels on some of the same frequencies as broadcast channels. In order to redistribute off-air signals within the home in the RF domain, they must be shifted to a nonoccupied frequency that can be tuned by the receivers, and signals coupling into the cable system must be avoided (or the cable companies will not hook up the residence to their system).

Alternatively, two distribution cables must be used (which moves the problem to the set where a remote A/B switch is then

interactive video by itself will pay for the infrastructure needed in building these residential access networks is still not clear. Most likely, additional services will be needed in order to justify the investment. These might include high bandwidth access to the Internet and to private networks, voice telephony, and cable television service. Others might be electronic games, home automation, home security, utility monitoring and utility control, along with many other as yet unimagined applications.

It is therefore expected that just about every variety of technology will be used to deliver signals to the home. Besides sending signals to the home through the traditional twisted pair and coaxial cables, communications companies will employ asynchronous digital subscriber line- (ADSL-) derived circuits, asynchronous transfer mode (ATM) circuits, hybrid fiber coax- (HFC-) derived circuits, personal communications services (PCS) circuits, and fiber to the home circuits. Some of these circuits will use various forms of compression (such as the Moving Picture Expert Group [MPEG] 1 and/or 2 standards), while others will be non-compressed. Some circuits will be analog, some digital, some both analog and digital, and others will migrate from analog to digital.

Adding to the complexity, these delivery approaches must be designed or redesigned to embrace the vastly expanded array of services foreseen. Such a variety of delivery networks will be required, too, to handle the interaction with a wide selection of equipment and networks on the customer's premises.

This environment will be confusing even to a telecommunications engineer, yet it is meant to address average end consumers. Their dollars are the driving force behind the new industry structure and all of the new technology. But these are the same consumers that, in 70 percent of the cases, still cannot program their videocassette recorders (VCRs). Yet work on this extensive investment has already begun, predicated on the belief that these end customers will see value in the highly complex and (in many instances) incompatible competing offerings, and will be able to easily use various combinations of these technologies.

As mentioned, a given residence may have broadband services supplied by a telephone carrier, a cable TV service provider, a utility company, or a wireless communications provider. Services going into that residence may enter over copper wires, hybrid fiber coax, RF transmission, fiber to the curb, or, most importantly, by any combination of these sources and structures. To have a successful market, residential customers (with the blinking 12:00s on their VCRs) must be able to move smoothly from one combination of these offerings to another so that the customers consider the move worthwhile.

For this multinetwork-to-multiservice interconnection to have value, it must be simple, and that simplicity is the basis for the residential gateway concept. In other words, the substantial complexity of the interconnection must be hidden from the consumer. The concept is essentially the development of a set of interface standards between the broadband residential access networks and the communication services (the internal networks) required for the consumer's home.

The benefits of this standardization will be shared by three groups. Consumers gain access to multiple communication providers and services. Operators of the access networks get standardized methods for

needed). Both alternatives add to the cost of a gateway implementation.

If the TV signal is digital, then the number of TV sets or VCRs that can consume separate programs at the same time is a function of the available isochronous in-home digital bandwidth and the number of tuners with eight-level vestigial sideband modulation decoders in the gateway. Since the TV sets/VCRs will also have tuners and these decoders, the consumer would pay for this hardware twice. And, of course, the single gateway antenna still prevents optimization for multiple signals at the same time.

Other conflicting requirements for subsystems being considered for replacement by the centralized hardware should also be kept in mind. For example, cable systems require grounding of the shield at the point where the cable enters the home. The National Electrical Code requires grounding at the electrical entry point. To avoid making a connection between those separate grounds and creating a ground loop, or worse facilitating excessive current flow in the shield of the coax cable (perhaps for only a short time), a gateway would have to be carefully designed and installed.

Meeting all the requirements of all the encompassed subsystems in one unit can have ripple effects. For example, to obtain approval for a security system from the Underwriters' Laboratory, battery stand-by power must be for the entire gateway, which can require a substantial battery along with battery-charging circuitry. The security system's mean time between failure requirements also apply to all parts of the gateway that could affect operation of the security system, which becomes a major challenge to meet.

These problems—along with similar ones to handle utility control and metering systems (with their own security requirements), satellite, MMDS, radio data streams, and other delivery systems—probably can be solved with good equipment design, expert installation, and enough money. But it is unclear how this centralized approach offers a lower cost solution than an incrementally installed distributed solution focused on each need of each consumer, particularly for those consumers whose systems never get to the full level supported by the centralized system.

In a technically elegant centralized residential gateway type system developed by Smarthouse L.P., Upper Marlboro, Md., in 1995, customers paid about US $6000 for the residential gateway-like portions of a fully installed system. Contrast that system with a distributed approach, where new communications capability is added incrementally, with no attempt to replicate existing content distribution paths.

The consumer does not pay for the resolution of inconsistent requirements for different subsystems. Instead, the capability that he or she buys would be directly correlatable to the desire for that new feature, that is, it would track their needs and budget of the moment. This contrasts with the single gateway approach that has a consumer making an initial investment to provide future capability, and then paying incremental costs to add each new function.

The experience gained by more than a score of years of designing electronic communication systems for the home screams out against attempting to do everything in one residential gateway. This will not succeed in the real world.

On a more positive note, standards to transparently provide capability for the customer's devices to communicate with each other are clearly needed. What must be developed are architectural approaches and standards that support any device putting traffic on the in-home network and handling one or many gateway-like functional devices, as well as other options.

—Arthur W. Allison III, National Association of Broadcasters

Arthur Allison is the facilitator of the Cross Industry Working Group of the ANSI Information Infrastructure Standards Panel, which addresses needs in residential networks among its tasks. He monitors in-home network standard-setting activities by a number of organizations. As a senior engineer with the National Association of Broadcasters, Washington, D.C., his responsibilities indude technical issue management with a focus on policy and technical developments of digital TV systems. Also active in standards activities related to TV broadcasting and industry convergence, he holds a key enabling patent on a central in-home communication system. He guided the re-engineering of the Smarthouse home automation system for commercial deployment.

managing the use of their infrastructure and for providing subscriber access to a wider range of services. And designers of the network and home application devices can take advantage of having a standardized interface point for their products, rather than trying to outguess the market and technology as to which interconnection for their devices will be most in demand.

The residential gateway

The residential gateway will be an intelligent cross-connect device based in general on the architecture of the personal computer [Fig. 1]. It will have two key functions: to terminate all external access networks to the home, with multiple residential services being delivered over each type of access network, and to terminate all home networks, such as the telephone, television, computing, alarm, and telemetry systems.

The residential gateway is only one example of bringing the customer into the center of focus, but it is most urgent because of the investments now being made. Now is the time for the standards bodies and the vendor research and development facilities to move forward with the concept.

In all future planning, it will be essential to concentrate on how the customer will be able to use new capabilities effectively and efficiently. As this new world of strange partners and massive mergers goes forward, the customer's viewpoint should be kept as the central focus for all investments and technology—paving the way for customer-centric designs and networks. ◆

Spectrum editor: Tekla S. Perry

About the author

Clifford R. Holliday (M), retired after more than 30 years as assistant vice president of operations and technology development for GTE Telephone Operations, Irving, Texas, currently operates B&C Consulting Services, Colleyville, Texas. The residential gateway proposal described in this article was developed by a group representing Bellcore, the David Sarnoff Research Center, GTE, Hewlett-Packard, IBM, and Reliance Communications. (Holliday's e-mail address is c.holliday@ieee.org)

To probe further

For more details on the application of the ideas of customercentric planning, see "Communications System Design" by Clifford Holliday, *Vision Planning*, October 1995.

Two articles dealing with the residential gateway concept and written by the author are: "The Residential Gateway—The Bridge to the Fiber Future," *Lightwave*, April 1996, and "Residential Gateway—Design Considerations" (with Philip R. Feigel), *Communications Systems Design*, July 1996.

A conference that will address the residential gateway concept, "Intelligent Terminal, Settops, and Gateways," will be held 2–7 November 1997, Dallas, Texas. Contact Barbara Derryberry at 972-997-6037 or Clifford Holliday at 817-267-8086.

The detailed residential gateway specification that was developed in an on-line conference during 1996 is available at http://info.GTE.com/gtel/sponsored/ResidentialGateway/. Current information on standardization activities that is related to the residential gateway is available at http://www.mislabs.com.